United Nations E/2013/50

Economic and Social Council

Distr.: General
22 April 2013

Original: English

Substantive session of 2013
Geneva, 1-26 July 2013
High-level segment

World Economic and Social Survey 2013: Sustainable development challenges

Overview*

Summary

The world is faced with challenges in all three dimensions of sustainable development — economic, social and environmental. More than 1 billion people are still living in extreme poverty, and income inequality within and among many countries has been rising; at the same time, unsustainable consumption and production patterns have resulted in huge economic and social costs and may endanger life on the planet. Achieving sustainable development will require global actions to deliver on the legitimate aspiration towards further economic and social progress, requiring growth and employment, and at the same time strengthening environmental protection.

Sustainable development will need to be inclusive and take special care of the needs of the poorest and most vulnerable. Strategies need to be ambitious, action-oriented and collaborative, and to adapt to different levels of development. They will need to systemically change consumption and production patterns, and might entail, inter alia, significant price corrections; encourage the preservation of natural endowments; reduce inequality; and strengthen economic governance.

The *World Economic and Social Survey 2013* aims towards contributing to the deliberations on sustainable development with a focus on three important cross-sectoral issues: sustainable cities, food security and energy transformation. While the entire range of thematic areas identified for action and follow-up in section V of the outcome document of the 2012 United Nations Conference on Sustainable Development, entitled "The future we want" (General Assembly resolution 66/288, annex), cannot be covered comprehensively in this *Survey*, highlighting three of the cross-sectoral issues may hopefully contribute to the addressing of sustainable development challenges in the follow-up to the Conference.

* The present document was submitted late owing to the delayed receipt of some critical inputs.

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Global sustainable development challenges post-2015

In September 2000, world leaders adopted the United Nations Millennium Declaration[1] which provided the basis for the pursuit of the Millennium Development Goals. A global consensus was successfully forged around the importance of poverty reduction and human development. Since then, the global community has managed to uplift a large segment of the poor and vulnerable. The world reached the poverty target five years ahead of the 2015 deadline. In developing regions, the proportion of people living on less than $1.25 a day fell from 47 per cent in 1990 to 22 per cent in 2010. About 700 million fewer people lived in conditions of extreme poverty in 2010 compared with 1990. Still, results fall short of international expectations and of the global targets set to be reached by the 2015 deadline. It remains imperative that the international community takes bold and collaborative actions to accelerate progress in achieving the Millennium Development Goals.

Continuation of current development strategies will not suffice to achieve sustainable development beyond 2015. Moreover, relying on "business as usual" scenarios presents clear risks, because evidence is mounting that:

(a) The impact of climate change threatens to escalate in the absence of adequate safeguards and there is a need to promote the integrated and sustainable management of natural resources and ecosystems and take mitigation and adaptation action in keeping with the principle of common but differentiated responsibilities;

(b) Hunger and malnourishment, while decreasing in many developing countries, remain persistent in other countries, and food and nutrition security continues to be an elusive goal for too many;

(c) Income inequality within and among many countries has been rising and has reached an extremely high level, invoking the spectre of heightened tension and social conflict;

(d) Rapid urbanization, especially in developing countries, calls for major changes in the way in which urban development is designed and managed, as well as substantial increases of public and private investments in urban infrastructure and services;

(e) Energy needs are likely to remain unmet for hundreds of millions of households, unless significant progress in ensuring access to modern energy services is achieved;

(f) Recurrence of financial crises needs to be prevented and the financial system has to be redirected towards promoting access to long-term financing for investments required to achieve sustainable development.

Over the past years, the global challenges to sustainable development have been driven by a broad set of "megatrends", such as changing demographic profiles, changing economic and social dynamics, advancements in technology and trends towards environmental deterioration. A better understanding of the linkages among these trends and the associated changes in economic, social and environmental conditions is needed. The United Nations Conference on Sustainable Development,

[1] See General Assembly resolution 55/2.

held in Rio de Janeiro, Brazil, from 20 to 22 June 2012, highlighted a range of interlinked challenges which call for priority attention, including decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness.[2] The present *Survey* focuses on three of these cross-sectoral issues with immediate implications for realizing sustainable development, namely: (a) sustainable cities, (b) food and nutrition security and (c) energy transformation. The other challenges are important, but a comprehensive discussion of them is beyond the scope of this *Survey*.

Partial convergence and persistence of inequalities

The progress that has been achieved in recent decades — and its unevenness — are tied intrinsically to changes in the global economy. Fast growth in some large emerging economies has led to a partial convergence in living standards, which exists side by side with abject poverty and a persistence of inequalities. Inequality undermines prospects for inclusive growth, equal access to social protection, and broader sustainable development by negatively affecting aggregate demand, investments in health care and education, and sociopolitical and economic stability.

In the decades ahead, diverse population dynamics have the potential to further exacerbate inequalities, both in developing and in developed countries, and at the global level. Increased urbanization, and rapid population growth, as well as population ageing, while reflecting rising prosperity in many countries, will put major stress on national and local infrastructures and public finance, as well as caregiving, health and education systems.

To address these challenges and to position for global sustainable development after 2015, a strengthened global development agenda will have to facilitate transformation in the way goods and services are produced, in the way jobs are created, in global consumption patterns, in the management of natural resources, and in the mechanisms of governance.

Strategies for pursuing sustainable development

Agenda 21[3] emphasized the interconnectedness among the three dimensions of sustainable development. Its actual implementation, however, arguably did not occur in the integrated manner envisaged. While the Millennium Development Goals focused attention on selected social and human development priorities, the world today witnesses emerging new challenges, aggravated by multiple financial, economic, food and energy crises, which have threatened the ability of all countries to achieve sustainable development. The United Nations Conference on Sustainable Development reaffirmed the political commitments of the international community to pursue sustainable development, under the principles of Agenda 21, including the principle of common but differentiated responsibilities.

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[2] See http://www.uncsd2012.org/about.html.

[3] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

Implementation process of Agenda 21 and the United Nations Conference on Sustainable Development

It is now clear that economic, social and environmental implementation efforts need to be reintegrated, and the tracks of discussion currently unfolding under the rubrics of the Millennium Development Goals and future sustainable development goals need to be thought of as dimensions of the sustainable development paradigm.

An important sustainable development challenge arises from unsustainable consumption and production patterns that have evolved in developed countries, a pattern that is increasingly being followed by developing countries. For example, per capita greenhouse gas emissions levels in developed countries are 20-40 times greater than needed for stabilization of the atmospheric greenhouse gas concentration. The per capita ecological footprints in developed countries are 4-9 times greater than their biocapacity. The high degree of inequality that accompanies and promotes these patterns makes them socially unsustainable and constrains achievement of the human development goals. Without an effective global agenda, high-income households, in developed as well as developing countries, are likely to continue to adopt unsustainable consumption practices.

Need for inclusive strategies and technology innovation

The outcome document of the United Nations Conference on Sustainable Development[4] provides guidance for achieving the transition to sustainable development as a means of increasing the well-being of current and future generations in all countries. Sustainable development strategies need to be inclusive and take special care of the needs of the poorest and most vulnerable. Strategies need to be ambitious, action-oriented and collaborative, taking into account different national circumstances.

They will need to systemically change consumption and production patterns, and might entail, inter alia, significant price corrections; encourage the preservation of natural endowments; reduce inequality; and strengthen economic governance. Such a process will need to minimize the types of consumption and production that have negative externalities, while simultaneously seeking to maximize the types of consumption and production that create positive externalities. Examples of minimizing negative externalities include reduction of environmental pollution, while examples of positive externalities include, for example, technology adaptation, reduction of food waste and enhanced energy efficiency.

Technology will certainly play a major role in this transformation. Changes in consumption patterns can drive the creation of new technologies necessary for sustainability and their adoption and diffusion at the desired pace. Success in bringing about these changes will require substantial reorganization of the economy and society and changes in lifestyles. Economic and financial incentives for the creation and adoption of new technologies will be needed which may include innovative policy reforms.

Poverty eradication, changing unsustainable and promoting sustainable patterns of consumption and production, and protecting and managing the natural resource

[4] General Assembly resolution 66/288, annex.

base of economic and social development are the overarching objectives of and essential requirements for sustainable development. In this large context, protection of climate and environment will need to be pursued as a universally shared goal. The global relocation of manufacturing and services sectors will also mean that appropriate technical regulation and social standards need to be adopted by developing and developed countries, with technical and financial support for developing countries.

The global sustainable development transformation entails, inter alia, significant price corrections, a strong commitment to preserving natural endowments, a reduction of inequalities, introduction of environmental accounting, strengthening of public spheres of life, redirection of the financial sector to the real economy and sharing of profit and employment. Transformation along these lines may be expected to increase the well-being of people, especially the poorest.

Sustainable development strategies of developing countries will continue to give priority to human development, with the eradication of poverty as its central goal. Human development requires more attention to be directed towards quality issues as well as coherence at the national level. Human development success depends to a large extent on using the opportunities created by globalization and on minimizing its negative effects. In this context, better management of capital flows and macroeconomic regulations may be necessary and coherence between national development strategies and global decision-making is important. Global institutions have to accommodate the special needs of developing countries, especially those of the least developed countries, the small island developing States, the landlocked developing countries and the countries in post-conflict situations. The global agenda will also need to attach greater importance to human rights, conflict prevention, good governance and reduction of inequality.

Developing countries have in fact put forward initiatives that are more advanced than those implemented by developed countries so far. For example, Ecuador and the Plurinational State of Bolivia enshrined the "rights of nature" in their recent constitutions. Many developing countries are developing their own sustainable lifestyle and consumption patterns, and offer aspirational models. Drawing on their traditional knowledge, they can in many areas leapfrog to more sustainable means of production, including greening of agriculture, industry and services. Developed countries can facilitate this process by offering appropriate cooperation in means of implementation, for example, through technology adaptation and transfer. Thus, both developed and developing countries can enter into a virtuous cycle of cooperation and engagement so as to ensure global sustainable development.

Towards sustainable cities

Urbanization provides new jobs and new opportunities for millions of people in the world, and has contributed to poverty eradication efforts worldwide. At the same time, rapid urbanization adds pressure to the resource base, and increases demand for energy, water, and sanitation, as well as for public services, education and health care.

Since 2007, more than half of the world's population has lived in urban centres and it is estimated that the proportion will have exceeded 70 per cent by 2050.

Eighty per cent of the world's urban population will live in developing regions, especially in cities of Africa and Asia.

During 1950-2010, a net 1.3 billion people was added in small cities, more than double the number of people added in medium cities (632 million) or large cities (570 million). The policy implications of the rising significance of middle and large settlements in the next 15-20 years are worth noting. In the future, these cities will be primarily located in low- and middle-income countries. In many developing countries, rapid urbanization calls for additional resources, and capacity development of local governments has become a pressing issue. It should also be noted that urban areas are constantly evolving as a result of people's mobility, natural population growth, socioeconomic development, environmental changes, and local and national policies.

The number of people living in slums might triple by 2050 if no policy framework is established to address this issue

In many cities of low- and middle-income countries, access to public services (e.g., water, sanitation, electricity and health care) remains inadequate. Challenges to the institutional capacities for improving access to sound infrastructure, decent employment, and reducing vulnerability to pollution, natural disasters and other risks, loom large. Upper middle- and high-income countries with urban centres that already have access to basic public services face the challenge of becoming more efficient in the use of energy and water, reducing the generation of waste and improving their recycling systems. Large and wealthier cities, in particular, may have well-managed resource systems but they also have larger ecological footprints.

Climate change impacts increase cities' vulnerabilities and put further stress on the adaptive capacities of the poor. Similarly, the ongoing economic crisis has increased underemployment of the educated youth in cities of poor and rich nations. Inequalities between rural and urban areas and within urban areas have been persistent features in many developing countries. About 1 billion people still live in slums lacking access to basic infrastructure and services such as water, sanitation, electricity, health care and education. There might be 3 billion slum dwellers by 2050 unless decisive actions are taken.

Effective urban management is a condition for cities' sustainability

The policy framework for the sustainable development of urban areas requires multilevel cooperation among local, national and global communities and partnerships to mobilize public and private resources. Democratic legitimacy and stakeholder consultation are important.

Sustainable development of urban areas requires integration and coordination, including regarding land-use issues, food security, employment creation, transportation infrastructure development, biodiversity conservation, water conservation, renewable energy sourcing, waste and recycling management, and the provision of education, health care and housing.

Synergies can be identified, e.g., between waste and recycling management (environmental management) and access to water and sanitation (social development),

between air quality conservation and green public transportation, and between production and distribution of renewable energy sources and green energy access, as well as between the goal of reducing inequities (effective urban governance) and access to education and health care (social development).

The *Survey* proposes an integrated set of investments in infrastructure, public services and capacity development for different groups of countries. An integrated approach to rural and urban development is critical. Investment in economic and social infrastructure in rural areas might improve productivity, reduce poverty and inequity and create additional opportunities for sustainable livelihoods.

Sustainable development of cities in poor countries entails investment in infrastructure such as roads, water, sewers, electricity and services such as schools, public transportation and health care. Leapfrogging investment in a green industrial transformation can generate youth employment. In cities of middle- and high-income countries, investment in infrastructure, renewable energy, buildings, and improved electricity and water efficiencies is important. Investment in the reduction of waste production and improvement of waste collection and recycling systems is needed in most cities across the world. Providing access to modern energy services is a real challenge to urban authorities in developing countries which often do not have enough capacity to respond, nor the ability to raise the needed long-term financial resources for investment.

A "one size fits all" approach towards sustainable development in cities is precluded, since cities' priorities, objectives and paths are highly diverse. Policy frameworks need to promote a common integrated approach, while differentiating among the responsibilities of upper-, middle- and low-income countries. Consequently, measures of sustainable development progress also need to be tailored to the particular challenges and opportunities identified and prioritized by the cities' main stakeholders.

Ensuring food and nutrition security

It is essential to ensure that everyone in the world has access to enough nutritious food. The *Survey* highlights the challenges in this regard and the changes to the food system that are needed to ensure food and nutrition security by 2050.

The target of halving the proportion of people suffering from hunger in sub-Saharan Africa will not be met

Basic food insecurity still affects 1 billion people, as many as in 1970. However, the proportion of people who are undernourished declined from about 20 per cent in 1990-1992 to 15 per cent in 2008-2010. Progress has been uneven across regions and the 2007-2008 food and financial crisis posed additional challenges. Under current conditions, the target of halving the proportion of people suffering from hunger by 2015 will not be met in sub-Saharan Africa and South Asia.

Because of low quality and low diversity of available food, the challenge of malnutrition is broader than the issue of hunger or undernourishment. Individuals may take in enough calories for daily subsistence, but still suffer from "hidden hunger" with low levels of micronutrients owing to the lack of diversification of

diets. This is a problem in both developing and developed countries, affecting 30 per cent of the world's population. The excess of calories is another rising major global public-health concern, as overweight and obesity result in more than 2.8 million deaths among adults every year.

Estimates indicate that food production will have to increase 70 per cent globally to feed an additional 2.3 billion people by 2050. Food demand is anticipated to continue to shift towards more resource-intensive agricultural products, such as livestock and dairy products, thereby exerting additional pressure on land, water and biodiversity resources.

On the supply side, meeting an increasing food demand is a major concern, given the rise of resource constraints. Current agricultural practices are a leading source of greenhouse gas emissions, while also leading to other problems, such as loss of soil fertility and water pollution from run-off. Increased temperatures and more volatile weather patterns caused by climate change may already be affecting crop yields, affecting incomes and agricultural production.

Increased land use for biofuels will increase constraints on the supply side and may lead to higher food prices, further affecting the most economically disadvantaged. Similarly, current urbanization trends accelerate the diversion of land use from agricultural production.

The food, water, energy, environment and climate nexus

An integrated approach to food security and the environment should take into consideration the food, water, energy, environment and climate nexus, while reorienting food production, distribution and consumption. Food security, while minimizing environmental impacts and increasing natural resource efficiency, will require increasing agricultural productivity, in particular in developing countries where agriculture accounts for a large share of gross domestic product (GDP) and where large productivity gaps still exist. Rapid increases in yields are deemed feasible, in particular where productivity gaps are high. At the same time, the protection of soil quality and crop and grazing land management, including restoration of degraded lands, have been identified as having the greatest agricultural potential to mitigate climate change, in addition to being cost-effective. Additional public investments in agriculture-related research and development will be crucial to increasing productivity.

The private sector will need to play a major role in expanding research, particularly in biotechnology, with a focus on food security. Special efforts are also needed to close the productivity gap of smallholder farms, which offer great potential for engagement in sustainable agricultural practices. Faster productivity gains among a large number of small-scale producers in very different agroecological regions will require improved dissemination and adaptation of technology to meet their specific needs.

A broad-based rural development strategy has to include infrastructural investments to better connect producers to output markets, including in rural-urban linkages and the improvement of distribution systems and storage facilities. The prospect of new economic opportunities, including institutional changes that facilitate access to input markets, as well as credit and insurance markets, will also

encourage smallholders, especially women farmers, in developing countries to increase their productivity.

Social protection mechanisms, including social safety nets, must also be part of a broader rural development strategy to facilitate access of low-income households to food. This will not only protect the most vulnerable against short-term economic shocks, but also contribute to long-term resilience by facilitating their access to food and by strengthening the ability of smallholders to manage risks and adopt new technologies with higher productivity.

Reducing food wastage may contribute to the sustainability of the food system

To reorient food consumption towards diets that are less-resource intensive and more nutritious will also be crucial for food sustainability. In particular, reducing food wastage may contribute significantly to the sustainability of the food system. Currently, it is estimated that 32 per cent of the total food produced globally is wasted. In order to substantially reduce the quantity of food lost and wasted, changes have to take place at different levels of the food chain: production, storage, transportation and consumption. In developed countries, efforts are most needed at the retail and consumer end, owing in part to management practices and consumption habits. In developing countries, interventions are needed at the producer end, before food reaches the market, to address inadequate harvesting techniques and storage conditions. Speculation in land and water has to be addressed at both the national and the international level. More investment funds will be needed to help implement these strategies and to support other countries in developing their own strategies for reinforcing the resilience of food production systems.

The international community can help developing countries in their efforts to design and implement policies that increase resilience to food price volatility and to climate variability. Priority actions should include reviewing trade policies to ensure that they support food and nutrition security, while establishing a transparent food market information system with timely information on regional and international stocks. The reliability and timeliness of early warning systems need to be improved at both the national and regional levels, with a focus on countries that are particularly vulnerable to price shocks and food emergencies. The current global trading system also needs to be reformed so that the poorest can be provided with just and fair access to markets.

Changing the production and consumption patterns of wealthier countries and consumers, including dietary habits, could make a remarkable contribution to ensuring food and nutrition security. The livestock sector, which has grown rapidly to meet the increasing demand for meat, is a prime contributor to water scarcity, pollution, land degradation and greenhouse gas emissions. This trend will need to be reversed in the context of more sustainable diets, but as long as market prices do not reflect such scarcities, there will be insufficient incentives for behavioural changes. Publicity, advocacy, education and legislation will need to be used to bring about such cultural changes so as to reduce high levels of retail and domestic food waste in high- and upper middle-income countries; furthermore, better policy instruments for promoting sustainable diets are still needed.

The energy transformation challenge

The transformation of the energy system needs to be a core element of the sustainable development agenda, in order to improve the living standards of people with equity and environmental sustainability. Under the Secretary-General's Sustainable Energy for All Initiative and in other contexts, explicit energy goals (or targets) have been suggested to end the dependence on traditional biomass as a source of thermal energy; to improve access to reliable, adequate and high-quality electricity; to facilitate convergence to best practices in the provision of energy services; and to ensure that unreliable or low-quality energy sources do not compromise the opportunities of the working poor who are self-employed or run household enterprises.

Transformation of the energy system needs to be a core element of the sustainable development agenda

The latest estimates confirm that emissions trends will likely lead to temperature increases with potentially catastrophic consequences. Even if all currently planned mitigation policies were fully implemented — including expanded use of renewable energy sources and improvements in energy efficiency — a stabilization of greenhouse gas emissions at 450 parts per million (ppm) will not have been achieved by 2050.

If one focuses on the rise in renewable energy, the advances in reducing pollution in some cities, the implementation of policies to improve sustainable development, and the adoption of international sustainability agreements, the world is undoubtedly greener today than it would have been if no actions had been taken. However, even after taking into account all of these factors, the likely outlook is that the desired emissions reduction targets will not be met.

According to some projections, emissions concentrations might reach between 650 and 700 ppm of carbon dioxide equivalent (CO_2e) by 2050 and between 800 and 1,300 ppm of CO_2e by 2100.[5] These increases would be associated with increases in global average temperature of 2°C-3°C by 2050 and of 3.7°C-5.6°C by 2100.

Multiple pathways towards sustainable energy have been identified. There are many existing energy technology options for mitigating emissions and increasing welfare. Hundreds of scenarios have shown that the world can follow a large number of energy paths towards sustainable development which require, however, ambitious policies, improved international cooperation, including in means of implementation, behavioural changes and unprecedented levels of investment.

Sustainable development pathways share common features

Despite their variety, sustainable development pathways share common features. First, the sooner the implementation of policies starts, the greater the technological flexibility and the less costly the actions required. Second, policies increasing efficiency in the delivery of energy services can go a long way. Perhaps the most

[5] See Organization for Economic Cooperation and Development, *OECD Environmental Outlook to 2050: The Consequences of Inaction* (Paris, 2012).

important insight provided by scenario analyses is that the world can go a long way towards controlling emissions, if it invests decisively in energy efficiency. Scenarios emphasizing improvements in end-use efficiency tend to meet sustainable development goals, such as ensuring (almost) universal access to electricity, maintaining air quality, and limiting global average temperature increases. However, if efficiency gains turn out to be small, the world will become highly dependent on rapidly improving innovation and increasing the supply of "clean" energy. Another insight is that sustainable development pathways have been devised that exclude nuclear power, and carbon capture and storage (and its bioengineering variants), technologies that face great sociopolitical and technical challenges. However, their exclusion would make the attainment of sustainable development much more challenging and require special measures to improve energy efficiencies and reduce demand.

Scenario results indicate that, in the absence of additional targeted pro-poor energy policies, by 2030, some 2.4 billion people will still rely on solid fuels for cooking, or 300 million more than the 2.1 billion so reliant in 2005. The implementation of a highly ambitious package of policies directly addressing the energy-poverty nexus has the potential to ensure access to modern energy of an additional 1.9 billion people. The policy package would have to combine financing (including microfinancing), to cover the upfront costs of enabling access to modern energy and the purchase of appliances, with a 50 per cent fuel subsidy in relation to market prices. Even such an ambitious set of policies, however, would still leave 500 million people without access to modern energy, most of them in rural Africa and in remote areas. Additional specific targeted programmes implemented through international development cooperation would be needed for modern energy services.

Energy transformation can be compatible with economic and social inclusion

The sustainable energy transformation can be compatible with economic and social inclusion. In particular, near universal access to clean cooking fuels and electricity can be achieved in harmony with measures devised to contain the increase of emissions and, pertinently, at a comparatively modest investment cost.

The *Survey* does not view technology as the main limiting factor for energy transformation, but is less sanguine about the economic, social and cultural hurdles associated with the implementation of national policies and achievement of a commensurate level of international cooperation.

The complex challenges that a sustainable energy transformation faces range from issues of growth, macroeconomic balances, and technology innovation and its diffusion, to human development concerns. They confer great importance on policy coherence. Moreover, industrial policies, technological innovation, transfer and adaptation, and energy plans based on integrated energy assessments require decisive, ingenious and coherent national policymaking and international cooperation.

Low-carbon, inclusive growth requires that the set of conditions needed to create the "enabling environment" for change be in place: policy space and coherence; international financing; international cooperation; and enabling international institutions, establishing rules and norms. It requires an enabling environment for the industrial policies needed to accelerate economic growth and foster green

sectors, as well as for large public and private investment projects. Adequate international financing needs to be available, especially to developing countries and the least developed countries. Domestic sources should be tapped to the extent possible, but the size of required investments will make international finance necessary. Designing national sustainable development strategies demands the integration of complex processes across the macroeconomy, the energy sector, the deployment of technology, policies for social and economic inclusion, and the environment. Building national capacities and international cooperation in these areas will be important. The world needs a big push — one that is public investment-led, based on international development cooperation, and capable of catalysing private sector investment and innovation so as to sustainably transform the energy system.

Financing sustainable development

Responding to the above-mentioned challenges requires large-scale investments. It is recognized that the fulfilment of official development assistance (ODA) commitments is crucial. Innovative financing mechanisms can also make contributions to developing countries in respect of mobilization of additional resources for financing for development. Sustainable financing needs to be ensured across sectors, including agriculture, forestry, energy, health and education, as well as across economic segments, such as small and medium-sized enterprises, infrastructure and innovation, in both developed and developing countries. Special attention needs to be directed towards financing the global commons (e.g., the atmosphere, oceans, biodiversity and forests) and global health. This *Survey* shows that delivering on present commitments to achieve the Millennium Development Goals already requires substantial additional public expenditure. It also identifies financing challenges related to the *Survey*'s three focus areas: sustainable cities, food security and energy transformation.

Achieving the Millennium Development Goals requires stepping up public spending

Evidence drawn from country-level economy-wide modelling analyses for 27 developing countries suggests that achieving the Millennium Development Goals by 2015 requires significantly stepping up upfront public spending in developing countries.[6] First, a business-as-usual scenario assessed progress towards meeting the Millennium Development Goals under expected economic growth, existing public spending priorities and budget financing policies. This baseline scenario assessed whether the countries would be "on track" or "off track" to achieve the targets, taking into account non-linearities in the effectiveness of social spending in achieving those targets. All 27 country-level studies found that, while substantial human development progress would be made with the current public expenditure scenario, only two countries (Chile and Cuba) would fully meet, by 2015, a set of

[6] These analyses were conducted by national researchers and government experts, with technical support from the Department of Economic and Social Affairs of the United Nations Secretariat and the World Bank. While Latin America has been comprehensively covered, only nine case studies for countries in Africa and Asia have been completed to date.

targets for primary school completion, reduction of child and maternal mortality rates, and expanded coverage of drinking water and basic sanitation.

For the cases in which business as usual was found not to be sufficient to achieve the goals, the analyses examined a number of policy scenarios under which public spending was stepped up as much as needed to achieve those goals from 2010 to 2015.

Meeting the human development targets was found to be affordable for only a minority of countries: 18 countries would need to raise their public spending by an extra 2 percentage points or more of GDP relative to the baseline with current policies. The public spending needed to meet the targets in the countries studied was estimated at about 7 per cent of GDP and, in some cases, the estimate was even higher.

An update of these analyses for six of the countries of Latin America and the Caribbean took into consideration the global financial crisis, by comparing social indicators under two scenarios, with and without the growth slowdown. It was found that the additional public spending requirements would have to rise by 1.6-3.4 per cent of GDP per year between 2010 and 2015 as a result of the economic growth slowdown — on top of the spending requirements that had been estimated for these six countries.

As indicated in the *Survey*, mitigation policies designed to curb carbon emissions through the adoption of renewable sources of energy will require substantial additional investments. Given the existing financing constraints, accelerated investments for sustainable development could overstretch countries' public finances.

Sustainable development requires coherence of fiscal policy and public investment allocations

Coherent policies for greenhouse gas mitigation, economic growth and human development need to be devised. The *Survey* presents evidence that taxing of greenhouse gas emissions in developed and developing countries can be useful. Not only could fiscal policy contribute to greenhouse gas mitigation, but — combined with a set of coherent policies — it could also change unsustainable consumption patterns, promote human development, and offset some of its potential economic costs. Three policy scenarios were simulated to illustrate that this may be the case, using the examples of three oil-importing developing countries. These scenarios are compared with a baseline which represents a continuation of currently expected economic growth and public spending interventions up to 2030.

The results show that, keeping all other things equal, unilateral taxes on the domestic price of fuel oil would depress intermediate and especially final consumption of fuel oil in the three countries. It is likely that carbon emissions would consequently be reduced and industries that supply oil-intensive goods for the domestic market and exports would be penalized. In fact, GDP growth is likely to be negatively affected.

If, alternatively, the new tax revenues were allocated to investing in public infrastructure, or expanding service delivery in education, instead of being used to reduce the budget deficit, the output loss would be offset partially or in some cases fully, mainly because such investments could spur productivity growth. Increased

availability of public infrastructure or better-educated workers would tend to raise productivity growth above the baseline.

Increased public infrastructure or service delivery in education could also have a positive impact on human development. Without coherent policy interventions, taxing fuel oil consumption alone could reduce promotion rates in primary education, as households' demand for education decreases with decreasing economic activity.

Financing the sustainability of cities will require multilevel cooperation

A close partnership between local and national authorities is needed to finance the sustainable development of cities. While cities need to raise financial resources from capital markets directly, financial oversight mechanisms must be in place to manage risks so that municipal borrowing does not result in an excess of non-performing loans in the banking system or the incurring of huge financial liabilities by the central government.

Poorer cities need international cooperation and additional resources to support green technology adaptation, and capacity development, and to provide access to public transportation, housing of sound construction, water and sanitation, electricity, health care and education. It is indeed a daunting task to finance investment in public infrastructure, including adaptation to and mitigation of climate change, which often demands large sums of upfront finance whose returns would be reaped mainly in the medium and long terms.

Richer cities need policies to encourage renewable energy and to reduce inefficiency and wasteful consumption. Regulatory measures are important for determining pricing structures, taxes and subsidies for households and industry — for the development, for example, of compact neighbourhoods and the retrofitting of buildings. Various types of taxes can be used to finance the gap between the financial outlay and the actual cost of services, for example, lower fares for public transportation.

Thus, for poor and rich cities alike, part of the financing would have to be directed towards addressing global environmental challenges and the livelihoods of present and future generations.

City financing may entail the use of a wide variety of instruments

Financing strategies for sustainable development in cities can draw upon a wide range of instruments. Bond banks and resource pooling can be useful instruments for reducing risk. Cities in developing countries have successfully issued bonds (without a guarantee from the national Government) to finance water supply and sewerage projects. Public-private partnerships can also help raise funds for infrastructure projects, particularly in developing countries with limited access to long-term credit. Public-private partnerships have been used to finance the production of renewable sources of energy and waste management. Cities may also leverage the value of land to finance infrastructure, either through the outright sale of land by auction or by issuing leaseholds to leverage the land's value. These instruments can generate the initial capital needed to cover start-up costs of

infrastructure investments. However, land-based financing instruments require relatively strong and effective institutions and well-articulated legal frameworks.

Sources of finance can have different degrees of stability and predictability. Taxation tied to business profits, which can fall during times of crisis, incurs greater risks than real estate taxes, because the revenues from the latter are more stable and easier to predict.

Agricultural development will require significant investments

Investment needs for primary agriculture and its downstream industries in developing countries were estimated at US$ 9.2 trillion (2009 dollars) over the 44-year period from 2005-2007 to 2050.

There are obstacles preventing higher investment in primary agriculture and especially in small farms. The insufficiency of public services limits potential returns to farmers' investments. Another issue is related to the lack of price incentives for small-scale producers, in particular when there are price controls on food products which reduce their potential net revenue. A third issue is the lack of access by smallholders to formal insurance protection against risks.

Private sector investments will be needed

Private investments in agriculture, particularly international private investments, are needed and can play an important role in boosting productivity and ensuring food security, when directed towards strategic needs. However, in order to increase the positive impact of these investments, Governments need to design policies and legislation that can create a more conducive climate for inclusive and sustainable investments. Direct incentives, for instance, such as tax incentives, can encourage investments that directly support local smallholders. Contract farming can also lead to positive investment, when small-scale farmers are assisted in contract negotiation and dispute resolution.

It is clear that public sources alone are not sufficient to address the needs in these domains. A framework for financing sustainable development needs to ensure that financing from private and public sources at the national, regional and international levels is secured. Financing has fallen short in areas that are critical for sustainable growth: long-term investment, including infrastructure financing, research and development and investment in riskier sectors, such as small and medium-sized enterprises and innovation; and financing of international cooperation.

Further, the long time frame necessary for infrastructure investments is outside the investment parameters of many institutional investors, even those considered to be "long-term" investors. The issue of a very long investment time-horizon arises in particular for low-carbon infrastructure projects, owing to higher risks and lower expected returns over the life of the project. In general, low-carbon technologies cannot compete with existing technologies, and this is unlikely to change unless market prices incorporate, to a much greater extent, the societal costs of using brown technologies, with their high levels of greenhouse gas emissions and other environmental risks.

Sustainable development will require significant investment from international private actors

A significant share of the investments necessary to achieve sustainable development will have to come from private sources, which nonetheless will depend on the availability of public funds to match those investments, through the provision of guarantees and/or regulation to assure future revenue streams. Public financing, regulation and private market-based financing will therefore have to be combined, based on the specific characteristics of the newly created assets.

A framework for the financing of sustainable development will need to be supported by an enabling policy environment at national and international levels and by renewed commitments to ODA. Such a framework will need to include policy initiatives to internalize externalities, better align private incentives with public goals, and finance efforts to address global challenges. Policy coherence across domestic, regional and international initiatives is crucial, as international and regional policy agreements shape national strategies, while national policies are part and parcel of the international and regional framework.